

Comparative Analysis of Economic Benefits and Adverse Environmental and Health Impacts of Asbestos Mining and Milling in Behram Dehri, District Charssada, Northern Pakistan

Noor Jehan¹, Khalid Durrani²

¹Department of Environmental Sciences, University of Peshawar, noorjpk1984@yahoo.com

²California Regional Water Quality Board Fresno, CA 93706, U.S.A., durranikp@gmail.com

Asbestos is not a mineralogical term but rather a commercial term applied to highly fibrous minerals including serpentine and amphibole asbestos. The principal varieties most commonly used in commerce are chrysotile, crocidolite, amosite, tremolite, actinolite and anthophyllite, all being used since the beginning of the industrial era around the globe. Presently asbestos is used in more than 3000 products including in the construction and textile industries, as heat-resistant material, special filters for industrial chemicals, thermal insulation products, friction material, gaskets, floor tiles, roofing materials, packing materials, paints and protective paper and as sprayed insulation and binding material for buildings and other structures (Shirde, 1973; Jehan, 1996). Apart from this it was also identified that asbestos is being used in detergent and talcum powder and soap and furniture in Pakistan.

Beside the commercial and economic importance, the exposure to all types of asbestos including chrysotile, tremolite, amosite, anthophyllite, crocidolite and mixture of all these have resulted in a high incidences of various cancers (lungs, larynx, gastrointestinal, ovarian) and malignant mesothelioma among humans (IARC, 1987).

This study highlighted the economic benefits and the environmental and health impacts posed by the asbestos mining and milling carried out in Behram Dehri District Charssada, northern Pakistan. Twenty small scale asbestos mines and 5 milling units were selected for sampling purposes. A total of 15 samples including raw and airborne were collected and analysed. The type of asbestos was identified as chrysotile tremolite using X-Ray Diffraction (XRD). The exposure level to asbestos fibers was found beyond the permissible exposure limit in all samples using Scanning Electron Microscope (SEM).

A detailed survey was conducted to identify the economic benefits and the adverse health impacts in the area under consideration. The total production capacity from all mines was recorded as 200 metric tonnes per day, worth of US\$5 per tonne. The overall total income generated from asbestos mining was calculated as US\$1,000 per day in the target area. Similarly the production capacity of 5 milling units was recorded as 200 metric tonnes per day, worth of US\$1,200 per day. The total income generated as a result of the asbestos business was calculated as US\$2,200 per day.

Despite being an economic mineral, the environmental consequences and the premature deaths and chronic illness among the asbestos miners and millers in the area require investigation. The mortality and morbidity rate among the miners and millers indicated that almost 50% of the total employees were suffering from asbestos-related diseases including lung cancer and malignant mesothelioma and skin allergies. The overall comparative analysis of this study concluded that the unaware and poor people are highly exposed around the clock to asbestos fibres and thus at high risk to asbestos related diseases at the cost of only US\$, 2,200/ per day in the study area. The unsustainable management of asbestos business created a considerable environmental chaos among the miners and the general public in the target area.

References

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